

as follows: A stem with leaves attached is cut very obliquely (under water), then attached to a glass slide, the cut surface being covered by a thin glass cover or another slide. Some freshly-precipitated calcium oxalate is introduced into the water under the cover-glass when the current passing into the stem is made evident by the granules which are drawn to the mouths of the vessels, accumulating as little plugs at their openings and finally being sucked in. In some experiments to verify these observations, made by Mr. J. M. Waugh under my direction in the botanical laboratory of Purdue University, an improvement upon the method used by Vesque was made. The method as before given was successful, but only after repeated trials and with considerable difficulty in properly illuminating the upper cut surface so as to make the grains of the calcium salt visible. Thinking that other teachers may like to know just the way to make this easy demonstration a success I give the details of the experiment.

The stem of the common *Clematis* of cultivation was selected because of its relatively large vessels. This, after being cut obliquely with a razor, was attached to an ordinary slide by means of two rubber bands and covered with thin glass. The whole of this operation must be performed under water. The superfluous water was then wiped from the slide and it was transferred to the stage of the microscope. The stem must be illuminated from above, either by the mirror, if that swings above the stage, the Lieberkuhn, or the side condensing lens. The lenses best adapted for this observation are the $\frac{3}{4}$ or $\frac{2}{3}$ objective with the 2-in. eye-piece. Instead of the calcium oxalate, indigo rubbed into a thin paste with water was employed. The advantage of indigo over the white calcium oxalate lies in the fact that it is very dark, and hence the small grains can be easily seen. The process, as shown by these granules, is a very interesting one. Some collect at the edges of the larger vessels, and some pass directly into the cavity. The observations carried on by Mr. Waugh seem to show that the cross between the imbibition and cavity theories is nearer the truth than either. The granules stick against the edges of the cut wall because water is imbibed by it, and the others continue up the cavity of the vessel because of the current there. Suddenly pinching the stem sets the current backwards, and quickly removing the leaves stops it altogether.—C. R. B.

EDITORIAL NOTES.

THE SUBJECT of bacteria is beginning to receive the attention, at the hands of the medical fraternity, that its great importance merits. Two notable works have just appeared from the press of W. T. Keener, Chicago, on bacteria and their relation to disease, by Drs. Gradle and Belfield, of the Chicago Medical Colleges. Both works are carefully written, and will prove interesting reading to others than the class to whom they are specially addressed.

FUNGOUS PLANTS, as a source of food, are receiving increased attention in both this country and Europe. A monthly journal, specially devoted to them,

has recently appeared in Germany, under the name of *Zeitschrift für Pilzfreunde*, containing "popular articles on edible and noxious fungi." Each number has twenty-four octavo pages and a colored plate with several figures, which, considering the low price of the journal (four marks a year), are fairly executed. The third number contains an article on the preservation and preparation of mushrooms for the table, in which six methods are given for preserving, besides drying, and seven recipes for cooking. We can not forbear giving the names of the dishes as an indication of the delicacies allowed to go to waste in our fields: Champignon-fricassée, mushroom sauce, mushroom soup, stuffed mushrooms, champignons à la provençale, champignons à la Cussy, and mushroom ketchup.

THE LIST OF PLANTS from which liquid water exudes is becoming quite large. Volkens describes the water-pores of 150 species, distributed through 91 genera and 36 families.

CHAREYRE, in *Comptes Rendus*, traces a connection between cystoliths and the hairs over them. He states that calcification begins in the hair, and in most cases goes on to form a calcareous mass in the epidermis below, which mass is the cystolith. Dr. Goodale, in *Science*, suggests that it is an interesting fact in this connection that cystoliths occur in leaves of plants which are perfectly smooth. We would also suggest, as equally interesting, that in *Pilea* splendid cystoliths occur, which are not in the epidermis at all, but several layers of cells below.

MR. W. W. CALKINS, of Chicago, has a splendid collection of Florida woods, containing 184 species of the 208 credited to that State. Each specimen is 5 to 10 inches in diameter, and 10 to 12 inches long. A list of the species has been published.

MR. GEORGE E. DAVENPORT'S check list of N. Am. Ferns has just been received, and should be in the hands of all botanists for convenience in cataloguing and exchanging. The moderate price of 25 cents a dozen places them within the reach of every one. The supplement to the catalogue of the Davenport Herbarium is also in hand, and adds 26 species, one being new. Mr. Davenport can be addressed at Medford, Mass.

DR. H. F. HANCE has just described a new *Podophyllum*, from Formosa, in the *Journal of Botany*. Heretofore the genus contained but the two species, our own *P. peltatum* and the Himalayan *P. Emodi*, but recently discovered in the Tangut country by Przewalsky, and both these species have solitary white flowers, differing chiefly in the fact that our species has twice as many stamens as petals, while the Himalayan form has stamens and petals equal in number. This new Chinese *Podophyllum* (*P. pleianthum*) has much larger isostemonous flowers of a dull red color, arranged in a pendulous group of five or six in the fork of the two stem-leaves; they are bractless and exhale a strong odor of putrefying flesh. This discovery is what might have been expected since the discovery of *Diphylleia* and *Caulophyllum* in Japan and Sachalin, and of *Jeffersonia* in Manchuria.

MR. A. B. MORGAN has published a second part of his "Mycologic Flora of the Miami Valley, O.," bringing up the genus *Agaricus* to 146 species.

SCIENCE still continues to give botany as much attention as at first, in the form of independent articles, book reviews, communications, and a weekly summary. Dr. W. G. Farlow looks after the latest information regarding cryptogams; the other writers were mentioned in our notice in the March GAZETTE.

ACTINOMYKOSIS is the name of a new disease in man and the lower animals caused by a fungus of the genus *Actinomyces*, which forms tumors near the angle of the jaw and proves fatal when it becomes generalized. It was the subject of remarks by Dr. Thomas Taylor and Dr. D. E. Salmon, at the meeting of the Biological Society of Washington, on the 25th of last month.

IN THE FOURTH volume of the "Monographiæ Phanerogamarum," just published, Dr. Engler monographs *Burseraceæ* and *Anacardiaceæ* and Count Solms-Laubach *Pontederiaceæ*. Two new genera of *Anacardiaceæ* are proposed, *Pleioygnium* on *Spondias acida*, Soland, and *Pseudospondias* on *Spondias microcarpa*, Rich.

A PRIZE of 500 francs has been offered by the *Société de physique et d'histoire naturelle de Genève* for the best monograph of a genus or family of plants. The prize was founded by the elder DeCandolle. The manuscripts are to be sent to Prof. Alph. DeCandolle, at Geneva, before October 1, 1884, and the members of the Society are not admitted to the contest.

THE PROCEEDINGS of the Society for the Promotion of Agricultural Science, just published, contains quite a number of articles on applied botany.

PROF. C. E. BESSEY has a pleasant article in the Transactions of the Iowa Horticultural Society, for 1882, entitled On Parasitic and Other Fungi, in which he points out the popular danger of entertaining extreme views of the harmfulness of these plants, not properly discriminating between good and bad.

AN ALPHABETICAL INDEX to the first ten centuries of Ellis' North American Fungi has been issued. It was compiled by W. C. Stevenson, jr., and is most carefully and satisfactorily done.

THE REPORT of the State Laboratory of Natural History of Illinois, which was lately issued, shows that that State is fully alive to the great need of an investigation of the parasitic fungi. During the collecting season of last year and the latter half of the preceding year, Prof. A. B. Seymour has been enabled to give his whole time to collecting throughout the State, with assistants to take care of the material as it arrived at the laboratory. A working library, herbarium, and instruments have been secured, and it is now proposed to work up this material along with future accessions into reports that will be of permanent value to the citizens of the State. It is an enterprise in the right direction, and deserving emulation.

DR. J. J. BROWN, of Sheboygan, Wis., has for several seasons experimented with field fungi for culinary purposes. He finds no fungi that one would be likely to gather for eating that are violently poisonous. His method for dis-

covering the valuable kinds is one that requires no scientific knowledge of the plants, and commends itself for its practical common sense. He gathers fresh, clean-looking specimens. If they have a bad or unpleasant odor when cooking they are discarded; and one will soon be able to tell the good from the bad at this time with considerable certainty. A small amount of the cooked fungus is then eaten; if it has a pleasant taste and no disagreeable results follow, it is partaken of more freely next time, and is soon put on the list of valuable kinds. Tasting of the fresh fungus is but little assistance, as an acrid or nauseating property is often dispelled in the preparation. There is no doubt that the danger of fungus-poisoning has been unnecessarily exaggerated. With the caution just pointed out the danger is so greatly lessened that it is practically reduced to zero, and no one need hesitate to make use of this abundant supply of nourishing and palatable food. It may be added that many sorts will be found harmless enough, but of no more culinary value than so much grass or wood, being either not juicy or without a rich flavor.

ON THE FIRST PAGE of the sketch of Dr. William Baldwin, published in our last number, at the end of the seventh line, for "Josiah," read "Joshua."

CURRENT LITERATURE.

A Revision of the genus *Fraxinus*, by TH. WENZIG, in Engler's *Botanische Jahrbuch*, iv. p. 164-188 (1883), is evidently the result of much pains-taking, and quite free from all tendency to undue multiplication of the species. In the American species he generally follows, and much commends, the Synoptical Flora of North America; making, however, certain changes, the propriety of which is to be questioned.

F. GREGGII, Gray, is given as a synonym of *F. Schiedeana*, Cham. & Schlecht. (which was Dr. Torrey's original suggestion), upon the evidence of the description. Wenzig has only Schiede's plant; we have only Gregg's and Bigelow's. So the case is not yet settled. A collection of our specimens with Wenzig's description of *F. Schiedeana* leads to a belief that the two are not identical, but we hope to have them directly compared.

Coming now to the American *Fraxinasters*, Dr. Wenzig makes the two subsections, *Epiptera* and *Periptera*, which we have insisted on, though without giving them names. But to our surprise he refers our *F. viridis* to the latter, thus separating it widely from *F. pubescens*, the samare of which are just the same. He does not figure the fruit of our *F. viridis*, which he has from "Brendel and Rühl" (Riehl?), surely either the wrong thing, or in abnormal form. Taking his species in order we have:

F. AMERICANA, L. To this is referred *F. juglandifolia* of Willd., as well as of Lam., doubtless on authority of the herbarium, and as the character by Willdenow looks that way, we may conclude that the reference of his plant in the Synoptical Flora to *F. viridis* is a mistake. The reference of the original of this latter name we will discuss in another connection. *F. epiptera* of Michaux is of course referred here.

Var. *MICROCARPA* and var. *TEXENSIS*, Gray, are simply adopted.

Var. *UHDEI* and var. *OVALIFOLIA*, are from Mexico, coll. Uhde, and are unknown to us.

Var. *PISTACIEFOLIA* is founded on *F. pistaciaefolia*, Torr., and we are unable to draw distinct limits between its forms and those of *F. Americana*.